Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Establishment of an Interference Temperature	)	
Metric to Quantify and Manage Interference and	)	ET Docket No. 03-237
to Expand Available Unlicensed Operation in	)	
Certain Fixed, Mobile and Satellite Frequency	)	
Bands	)	
	)	

JOINT COMMENTS OF THE ASSOCIATION FOR MAXIMUM SERVICE TELEVISION, INC., AND THE NATIONAL ASSOCIATION OF BROADCASTERS

Dated: April 5, 2004

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SUMMARY

MSTV and NAB welcome efforts by the Commission to grapple with the problem of managing interference, particularly as the proliferation in recent years of a wide variety of licensed and unlicensed RF emitters has created a more challenging interference environment for licensed spectrum users. To this end, the interference temperature metric outlined by the Commission could serve as a valuable tool for regulators to quantify and better understand the real-world interference environment in the various bands in which licensed services operate. However, significant technical challenges must be addressed before such a metric can be used as a basis for spectrum management decisions instead of merely serving an informational and monitoring function. In particular, the interference temperature metric should not be used as a justification to introduce unlicensed operations in licensed spectrum bands, especially while the interference temperature metric remains a theory and is not close to being implemented. Instead, unlicensed operations should be limited to spectrum bands specifically allocated for such uses.

Should the Commission go forward with permitting unlicensed operations under the interference temperature approach, registration of these devices should be required and unique identification codes should be incorporated into the transmission function of each device. Further, MSTV and NAB strongly oppose permitting the operation of unlicensed devices in broadcast spectrum, particularly during the DTV transition. Broadcasting, with an open architecture in which broadcasters exert no control over the characteristics of receivers, is particularly ill-suited to handle potentially-interfering unlicensed devices operating on an "underlay" basis. Moreover, broadcasters are already in the midst of a complex and challenging transition to DTV, and any suggestion that unlicensed devices will be permitted to operate in broadcast spectrum will only add uncertainty and hinder the transition.

Finally, MSTV and NAB oppose the premature proposal to permit unlicensed devices in the 12.75–13.25 GHz band under the interference temperature approach. This band is used intensively by broadcasters for certain types of BAS operations, and should not be jeopardized as part of an experimental approach to spectrum management. The Commission must first, at minimum, establish that the interference temperature approach can be successfully implemented in real-world operating conditions.

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THE NATIONAL ASSOCIATION OF BROADCASTERS

The Association for Maximum Service Television, Inc. ("MSTV") and the National Association of Broadcasters ("NAB")[1] file these comments in response to the Commission's Notice of Inquiry and Notice of Proposed Rulemaking ("*NOI*" and "*NPRM*," together, "*Notice*") in the above-captioned proceeding.[2]

MSTV and NAB support innovative approaches to spectrum management, and appreciate the significant steps the Commission has taken in recent years to reexamine its spectrum management policies. For example, MSTV and NAB applaud the Commission for recognizing that its traditional approaches to spectrum management do not always adequately consider the actual interference experienced by receivers under real-world operating conditions.

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[1] MSTV is a non-profit trade association of local broadcast television stations committed to achieving and maintaining the highest technical quality for the local broadcast system. NAB is a non-profit, incorporated association of radio and television stations that serves and represents the American broadcast industry.

[2] *Establishment of an Interference Temperature Metric to Quantify and Manage Interference and to Expand Available Unlicensed Operation in Certain Fixed, Mobile and Satellite Frequency Bands*, Notice of Inquiry and Notice of Proposed Rulemaking, ET Docket No. 03-237, FCC 03-289 (rel. Nov. 28, 2003).

To this end, the interference temperature metric discussed in the *Notice* could serve an important role in monitoring and quantifying the actual interference environment in which receivers operate, enabling the Commission to make more informed spectrum management decisions regarding new spectrum-based services and interference to existing licensed services.

However, MSTV and NAB caution the Commission against going forward with a regulatory approach that has not been tested and which involves several formidable implementation problems. The Commission should proceed cautiously, studying the interference temperature concept and addressing the significant technical issues involved with implementing such a metric before making decisions that would permit new unlicensed operations in spectrum already occupied by licensees whose users have settled expectations as to quality of service and protection from interference. Under no circumstances should the Commission consider implementing the interference temperature approach or permitting unlicensed operations in the broadcast spectrum at this time, particularly as broadcasters continue to face the complex and challenging transition to DTV. Because of the negative impact on the performance of new digital television receivers and the problems associated with repacking television spectrum, the Commission should avoid introducing new RF noise into the television band at this time.

I. THE COMMISSION SHOULD PROCEED CAUTIOUSLY AS IT CONSIDERS ADOPTING AN "INTERFERENCE TEMPERATURE" APPROACH TO MANAGING INTERFERENCE, ESPECIALLY SINCE THIS APPROACH HAS NOT BEEN TESTED IN THE REAL WORLD.

MSTV and NAB have long championed the importance of interference management, particularly as spectrum-based services have grown exponentially in recent years and as real-world interference to licensed users has increased. However, while the interference temperature metric discussed in the *Notice* may be useful for quantifying and monitoring real-world interference and noise levels, we believe that there are significant, practical obstacles that

would prevent it from being effectively used for managing interference. As a result, MSTV and NAB caution the Commission against proceeding with the premature adoption of spectrum management policies that depend upon the actual implementation of the interference temperature metric.

A. MSTV And NAB Welcome Innovative Approaches To Spectrum Management, And In Particular Support Efforts To Monitor And Quantify Noise Levels In Licensed Spectrum Bands.

MSTV and NAB support the Commission's efforts to use new, innovative approaches to managing interference concerns. As the number and variety of RF emitters has grown, the Commission's traditional approach of using predictive interference analyses has often failed accurately to predict the real-world impact of such emitters on incumbent licensed users.[3] This problem has been exacerbated by the proliferation of low-power unlicensed and other secondary devices that have caused cumulative interference that is difficult to predict and even harder to control. For example, the inability to predict cumulative interference led to the significant deterioration of AM broadcast radio.[4] Thus, MSTV and NAB support innovative interference management approaches that focus on the actual interference experienced by licensed services.

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[3] As the Commission's 2002 Spectrum Policy Task Force Report noted, "[i]nterference management has become more difficult because of the greater density, mobility and variability of RF emitters and because users have been granted increased flexibility in their spectrum use." Report of the Spectrum Policy Task Force, ET Docket No. 02-135, at 25–26 (Nov. 2002) ("*Task Force Report*").

[4] *See Amendment of the Commission's Rules to Improve the Quality of the AM Broadcast Service by Reducing Adjacent Channel Interference and by Eliminating Restrictions Pertaining to the Protected Daytime Contour*, 4 FCC Rcd 3835, 3842 (1989) (Separate Statement of Commissioner Dennis) (noting that the FCC's policies resulted in increasing interference to AM radio service and corresponding listener dissatisfaction); *see also* Comments of MSTV and NAB, ET Docket No. 02-135, at 8–9 (Jan. 27, 2003).

While there remain significant challenges in implementing it, the interference temperature metric proposed by the Commission could serve as a valuable monitoring mechanism for quantifying and better understanding the interference environment in which licensed services operate.[5] As the Commission's spectrum management policies have increasingly permitted spectrum sharing and spectrum flexibility, it has made decisions to permit unlicensed and secondary spectrum users to operate in bands occupied by incumbent licensees.[6] These decisions to permit spectrum sharing and new services have necessarily been based on predictions of interference, and are typically not revisited to determine whether the interference predictions have borne out in the real world.[7] The interference temperature metric could be used as part of a band-by-band analysis of the real-world interference environment and noise floor in various spectrum bands. By monitoring and quantifying existing interference environments, the Commission will be better able to predict the interference effects of new services and spectrum sharing arrangements.

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[5] Reply Comments of MSTV and NAB, ET Docket No. 02-135, at 10 (Feb. 28, 2003); Comments of Sprint Corp., ET Docket No. 02-135, at 13–16 (Jan. 27, 2003) (opposing interference temperature proposal, but supporting better understanding of noise floor); Comments of AT&T Wireless, ET Docket No. 02-135, at 8–13 (Jan. 27, 2003) (same).

[6] *See, e.g.*, *Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems*, 17 FCC Rcd 7435 (2002) (permitting unlicensed, ultra-wideband devices to operate in frequencies occupied by licensed spectrum users).

[7] The problems with the Commission's current predictive approach to interference management are highlighted in the 800 MHz public safety/Nextel spectrum swap proposal proceeding. *See Improving Public Safety Communications in the 800 MHz Band*, Notice of Proposed Rulemaking, 17 FCC Rcd 4873 (2002). Public safety users in the 800 MHz band increasingly experienced interference from neighboring cellular/PCS providers, even though all parties were operating within established technical limits — an example of the failure of the Commission to predict accurately the interference caused by the growth of new services.

B. The Interference Temperature Approach Outlined By The Commission Does Not Yet Provide A Real-World Answer To Interference Challenges.

While the interference temperature metric could play an important role in quantifying and monitoring the interference environment in different spectrum bands, it remains at best a theory, particularly with respect to devices being able effectively to adapt to highly localized and time-sensitive propagation and interference characteristics. Thus, the interference temperature metric is far from being able to provide a sufficiently reliable foundation for spectrum allocation decisions and spectrum management policy.

The *NOI* includes a lengthy discussion of various technical challenges to implementing an interference temperature metric as a spectrum management tool.[8] MSTV and NAB support the Commission taking the first steps that would be needed before any consideration of a temperature-based interference regime could be contemplated. The first step — and one broadcasters have supported for many years — would be for the Commission to increase its knowledge about the level of RF emissions in various frequency bands at differing times and places. The *NOI* mentions several possibilities for obtaining new data, from individual device measurements to a centralized database to a continuously-operating grid of monitoring stations.[9] While each of these may prove useful in assembling valid data on RF levels, each remains a theoretical approach and some, such as establishing a centralized database for interference measurements, are well beyond anything that has been implemented in the realm of spectrum studies.

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[8] *Notice* ¶¶ 10–14, 20–23.

[9] *Notice* ¶¶ 11–12.

While adding to the Commission's knowledge of the levels of RF emissions in differing frequency bands will prove useful in developing new spectrum policies, that alone is hardly sufficient to establish an interference temperature-based spectrum management regime. For in addition to knowing a patient's temperature, a doctor must also know the level at which the patient becomes sick.[10] Thus, in addition to determining the amount of RF energy that is emitted in various frequency bands, the Commission will have to develop data on the interference-rejection characteristics of literally thousands of receiver types that may be present in the marketplace.[11] Without a complete understanding of the way in which existing and future receivers deal with unwanted signals, it would be impossible to develop a workable system of allowing new devices to operate as long as the total emissions in the band remain below a specified signal level. Establishing such a database of interference rejection characteristics of receivers will require a substantial effort.

Even after these tasks are accomplished, and assuming that the Commission is able to settle on a single interference temperature limit for each spectrum band, there will remain significant technical challenges to using interference temperature as a spectrum management tool. The *NOI* discusses several of these issues, including the question of how devices would

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[10] It also appears far from certain that the complexities of the RF environment can be reduced to a single interference temperature. *See Notice* ¶ 20. Not only are there multiple factors that determine the effectiveness of signal reception by receivers, but a single interference temperature does not appear likely to accurately gauge the impact of unlicensed devices on licensed operations where the frequency band is already shared by licensed users.

[11] In the broadcast band, for example, even after the DTV transition is completed and analog broadcasting has ceased, millions of consumers may continue to use existing analog receivers with converters. The characteristics of these analog sets will continue to be relevant in any decision concerning new users of the television band.

respond when a maximum interference temperature limit is exceeded.[12] The interference temperature approach has not yet been tested as an operational mechanism by which devices would actually alter their operation in response to complex dynamic measurements of the interference temperature across an area of potential interference. MSTV and NAB, along with several other parties, have in the past identified important concerns regarding the feasibility of implementing and enforcing interference temperature limits.[13] In the *Spectrum Policy Task Force Report* proceeding, several commenters observed that because interference environments are extremely localized and dynamic, it is extremely difficult, if not impossible, for a transmitter in one location to be aware of the interference environment at a receiver's location.[14] This problem is made more difficult by, for example, the "hidden transmitter" problem.[15] Moreover, several commenters in that proceeding noted that the interference temperature approach to

[12] *Notice* ¶ 13–14.

[13] *See, e.g.*, Comments of MSTV and NAB, ET Docket No. 02-135, at 11–14 (Jan. 27, 2003).

[14] Comments of Cingular Wireless LLC, ET Docket No. 02-135, at 29–30 (Jan. 27, 2003); Comments of Wireless Communications Association, ET Docket No. 02-135, at 11 (Jan. 27, 2003); Comments of Motorola, ET Docket No. 02-135, at 14, App. 8 (Jan. 27, 2003); Comments of AT&T Wireless, ET Docket No. 02-135, at 10–11 (Jan. 27, 2003) (noting, for example, that AM radio reception can turn from clear to unintelligible in a few feet, which makes it difficult for a potentially interfering device to predict whether it will cause interference to an AM radio receiver).

[15] A hidden transmitter is one whose transmissions are not detected by another potentially interfering transmitter, but whose transmissions contribute to the interference received by a licensed system if the interfering transmitter were to begin transmitting. In other words, the potentially interfering transmitter does not "see" the hidden transmitter and assumes that it is the only transmitter detected by the licensed system, but in fact the licensed system detects and receives transmissions from both transmitters. *See* Comments of AT&T Wireless, ET Docket No. 02-135, at 11 (Jan. 27, 2003); Comments of Motorola, ET Docket No. 02-135, at 27 (Jan. 27, 2003).

spectrum management depends on the existence of smart radios which are not yet widely available and have not been tested under real-world operating conditions.[16]

Thus, MSTV and NAB support the Commission in efforts to assemble the building blocks of what may become a valuable spectrum tool in the future. The daunting technical and informational challenges — particularly in the complex environment of the broadcasting bands[17] — mean that the Commission cannot envision implementing a temperature-based spectrum policy in the near term. Instead of using the interference temperature metric as a basis for making spectrum management decisions, MSTV and NAB suggest that use of this metric be confined to a monitoring function at this time.

C. Interference Temperature Limits Should Not Be Used To Justify The Introduction Of Unlicensed Devices In Licensed Spectrum Bands.

MSTV and NAB oppose the Commission's proposed establishment of an interference temperature metric as a means to expand unlicensed "underlay" operations in spectrum bands occupied by licensed users. Under the Commission's suggested approach, low-power unlicensed devices would be permitted to operate in spectrum bands occupied by licensed users as long as the detected interference temperature did not exceed a predetermined limit.[18] However, even assuming that accurate interference temperature measurements are possible, there remain several significant problems with using this metric to justify the introduction of unlicensed devices in licensed spectrum bands.

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[16] Comments of AT&T Wireless, ET Docket No. 02-135, at 11 (Jan. 27, 2003); Comments of CTIA, ET Docket No. 02-135, at 12 (Jan. 27, 2003); Comments of Wi-Fi Alliance, ET Docket No. 02-135, at 6 (Jan. 27, 2003).

[17] *See* Section I.D, *infra.*

[18] *Notice* ¶ 16.

First, there is the problem of selecting the appropriate interference temperature limit, a step which if the limit is set too high could constrain current services and future innovative uses of the spectrum by licensed users. A second and more fundamental problem with using the interference temperature metric to justify introducing unlicensed underlay operations is that there would be no effective method for enforcing the Commission's rules requiring devices to cease operating (or otherwise change their operating characteristics) if the interference temperature limit were exceeded.

Once unlicensed devices are introduced into the market, they are difficult if not impossible to locate and then control.[19] As more and more unlicensed devices are sold directly to consumers, tracing offending devices — devices which intentionally or unintentionally exceed the applicable interference temperature limits — and making them cease operations becomes an increasingly futile task. While it is true that at present unlicensed devices operate successfully despite being similarly untraceable once they are introduced into the market, there are at least two reasons why existing unlicensed operations are different from the new unlicensed operations that are being discussed in the *Notice*. First, the existing equipment authorization process for unlicensed devices involves well-understood technologies, making it somewhat easier to predict the interference impact of existing unlicensed operations. Second, unlicensed devices currently operate in spectrum bands that are either dedicated for unlicensed operations or are shared with

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[19] *Task Force Report* at 58 ("[O]nce unlicensed devices begin to operate . . ., it may be difficult legally or politically to shut down their operations even if they begin to cause interference or otherwise limit the licensed user's flexibility."); Comments of AT&T Wireless Services, Inc., ET Docket No. 02-135, at 12 (Jan. 27, 2003) (noting that potentially interfering unlicensed devices are itinerant and unidentifiable); *Review of Part 15 and Other Parts of the Commission's Rules*, First Report and Order, ET Docket No. 01-278, 17 FCC Rcd 14,063, 14,067 (2002) (describing interference caused by unlicensed radar detectors to VSATs in the 11.7-12.2 GHz band, and noting that the radar detectors could not easily be identified or, even if identified, controlled).

services that use spectrum sporadically and that are prepared for a somewhat uncertain interference environment. The new unlicensed operations that are being contemplated would share spectrum with licensed primary services unaccustomed to sharing spectrum, making worse the impact of potentially interfering unlicensed underlay devices.

Moreover, although the Commission's rules theoretically prohibit unlicensed devices from interfering with licensed services,[20] this rule cannot be enforced once the devices are in the hands of consumers. Because they are not licensed, unlicensed devices that cause interference do not appear in any FCC or industry database and cannot easily be detected and made to cease operation were they to cause interference.[21] In addition, even though the Commission's rules state clearly that unlicensed devices shall not acquire any vested rights in continued use of spectrum bands,[22] it is difficult in practice for the Commission to make unlicensed devices cease operation and vacate particular spectrum once consumers have invested in such devices.[23]

MSTV and NAB suggest that the Commission consider carefully the problems with enforcement *before* authorizing unlicensed devices on frequencies that are occupied by existing services. Specifically, protection mechanisms identifying unlicensed devices that are

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[20] 47 C.F.R. § 15.5(b).

[21] Without effective means for enforcing rules designed to ensure that unlicensed devices do not interfere with authorized users of the broadcast bands, for example, neither broadcasters nor the Commission would be able to resolve any interference problems that might arise.

[22] 47 C.F.R. § 15.5(a).

[23] *See, e.g.*, *Amendment of Parts 2 and 95 of the Commission's Rules to Create a Wireless Medical Telemetry Service*, ET Docket No. 99-255, 15 FCC Rcd 11,206, 11,225 (2000) ("Despite the fact that medical telemetry has no legal protection from interference in [the broadcast] bands, the fact remains that the Commission has had to take steps to protect medical telemetry from interference . . . . The steps the Commission has taken, such as . . . the requirement for DTV stations to notify nearby health care facilities, affect other parties.").

causing interference should be in place prior to authorizing such devices. Furthermore, registration of these devices should be required, and unique identification codes should be incorporated into the transmission function of each device. Such protections will help licensed services to identify sources of interference so that the Commission can take necessary steps to eliminate interference.

D. The Broadcast Spectrum Is Particularly Ill-Suited For Unlicensed Devices Operating Under The Interference Temperature Approach.

Even assuming the Commission proceeded with permitting unlicensed underlay operations in spectrum bands occupied by licensed services, allowing such unlicensed operations in the broadcast spectrum would be particularly problematic.[24] In the context of a closed system, in which a single operator controls both the transmitters and the receivers that operate in a particular frequency band, the operator can make design choices that trade off the characteristics of transmitted signals and the performance of receivers. Such operators would find themselves in a better position to adapt to new unlicensed devices operating in their assigned spectrum, and to pinpoint the cause of and address any new interference introduced by the new devices. Broadcasting, on the other hand, is an open architecture system, meaning that broadcasters have no control over the receivers used to receive broadcast services.[25] Because broadcasters lack the ability to control the design of either television receivers or the new unlicensed devices that may

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[24] MSTV and NAB have earlier discussed in detail the reasons why unlicensed "overlay" operations should not be permitted in the broadcast spectrum. Comments of MSTV, NAB, and APTS, ET Docket No. 02-380 (Apr. 17, 2003). This discussion is largely applicable to unlicensed underlay operations as well.

[25] Even new DTV sets, manufactured in accordance with the Commission's rules, do not have mandatory standards for receiver performance.

inhabit broadcast spectrum, they are particularly vulnerable to interference problems and powerless to tackle interference problems should they arise.[26]

Our concerns are heightened given the very nature of free, over-the-air broadcasting and viewers' response to interference problems. Broadcasters' experience with interference from land mobile operations demonstrates that interference to over-the-air broadcasting is impossible to police. Viewers have a low tolerance for interference, and tend simply to switch channels when confronted with interference on their radio and television receivers rather than attempt to pinpoint the source of interference.[27] This problem is exacerbated in the digital world by the fact DTV is an "all-or-nothing" service, where a viewer suffering from a lost picture for even a few moments would be inclined to seek programming from another medium.

Moreover, in addition to the problems discussed above, television broadcasters are currently in the midst of a complex and uncertain transition to DTV, while radio broadcasters are beginning to implement In Band On Channel ("IBOC") digital technology. Even a suggestion that the broadcast spectrum could be inhabited by new unlicensed underlay devices would only complicate, burden, handicap, and further delay these transitions. In an earlier filing, MSTV and NAB submitted a study by Strategic Policy Research that indicated that a "critical mass" of consumers must adopt DTV in order to start a "bandwagon" effect where DTV sets

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[26] At present, the market includes more than 250 million analog sets and approximately one billion radio receivers (whose performance characteristics are, for the most part, not regulated and not known by the Commission), as well as evolving generations of digital sets. Consumers have paid for those sets — which were manufactured pursuant to design specifications that did not contemplate shielding the sets from unlicensed devices — and should not be forced to replace them to avoid interference from secondary users.

[27] *See* Comments of MSTV, NAB, and APTS, ET Docket No. 02-380, at 11–12 (Apr. 17, 2003); *see also* Engineering Report of Moffet, Larson & Johnson, Inc., attached as Appendix A to Reply Comments of NAB, MM Docket No. 99-25, at 10 (Nov. 15, 1999).

rapidly penetrate the market.[28] This study also highlighted the danger of potential interference from new unlicensed uses of the broadcast spectrum. According to the study, if government policies have the effect of "potentially disabl[ing] the new service — perhaps even only on a sporadic basis — this will inhibit the new service's ability to achieve critical mass, spontaneous feedback and service takeoff."[29] That is, if unlicensed devices operating in the broadcast band caused "sporadic reception failures . . . with the result that, at the margin, fewer viewers choose to view digital television over-the-air[, t]hat would potentially produce a variety of *adverse* (as opposed to positive) feedback effects" that ultimately could derail the digital transition.[30] The irony is that permitting unlicensed use on broadcast spectrum during the DTV transition may prevent the FCC from achieving its primary objective — a more efficient use of the broadcast band.

Finally, even if the Commission were to allow unlicensed devices in only part of the broadcast spectrum — for example, by adopting different maximum interference temperature levels in different channels — this would nevertheless have a severe negative impact on the DTV transition. It is incorrect to assume that there will be significant areas where unlicensed wireless devices can be used without affecting over the air television reception. Accommodating television stations currently occupying channels 52–69 with in-core channel assignments will be a monumental task, especially in large congested markets, where spectrum will be used intensively. Furthermore, one of the most significant components of the DTV transition is the

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[28] John Haring and Jeffrey Rohlfs, Strategic Policy Research, *Permitting Unlicensed Devices on Broadcast Spectrum During the DTV Transition: Substantial Costs and Risks, Largely Speculative Benefits*, at 14-15 (April 2003) (*SPR Report*), attached to Comments of MSTV, NAB, and APTS, ET Docket No. 02-380 (Apr. 17, 2003).

[29] *SPR Report* at 14.

[30] *SPR Report* at 14-15 (emphasis in original).

selection of a final DTV channel. Selecting a final DTV channel will involve a number of technical and economic issues, and permitting unlicensed devices on specific frequencies within the television band will have a direct adverse impact on the channel election process. Moreover, allowing such devices to operate on any portion of the broadcast spectrum may make it extremely difficult to repack broadcast spectrum in an efficient manner.

For the next several years at least, any exploratory work on underlay operations must not focus on broadcast spectrum bands. As the Commission looks for ways to encourage faster consumer acceptance of DTV to speed along the digital transition, introducing new potential interference sources that may result in loss of service would be counterproductive.[31]

E. Unlicensed Operations Are Best Limited To Spectrum Bands Dedicated For Such Uses.

MSTV and NAB believe that rather than considering a complex and unworkable scheme of spectrum sharing between licensed services and unlicensed underlay operations, the Commission should instead focus on clearing additional bands to be allocated to unlicensed operations on a dedicated basis. While some wireless services have been successful in sharing spectrum in certain bands, unlicensed devices are particularly unsuitable for sharing spectrum with licensed spectrum users because, as discussed above, they cannot be located or controlled once they are introduced into the marketplace. This makes impossible or at least extremely difficult the enforcement of technical rules designed to prevent interference to licensed spectrum

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[31] An example of the uncertainties prevalent during the DTV transition involved interference between DTV transmissions and medical telemetry equipment. The problem took both the television stations and hospitals by surprise in 1998, when DTV transmitters first began operating. *See Amendment of Parts 2 and 95 of the Commission's Rules to Create a Wireless Medical Telemetry Service,* 14 FCC Rcd 16,719, 16,722 (1999) (describing a March 1998 incident involving interference from a DTV station in Texas to medical telemetry equipment at a nearby hospital).

users. Moreover, there is little reason to believe that the potential harm to licensed users[32] would be balanced by significant advantages to unlicensed operations. Even proponents of unlicensed operations vastly prefer a spectrum allocation that is dedicated for unlicensed operations.[33] Unlicensed operations have shown great promise in spectrum bands dedicated to such uses, where manufacturers have more than the promise of opportunistic access to spectrum and thereby greater incentive to invest in the mass-production of unlicensed devices. Such incentives and economies of scale led to the growth and widespread success of unlicensed technologies such as Wi-Fi.[34]

In short, both licensed and unlicensed spectrum users would be better served by respectively operating in dedicated spectrum, instead of being forced to share spectrum under a complex and potentially unenforceable spectrum-sharing scheme.

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[32] *See* Sections I.C and I.D, *supra*.

[33] *See, e.g.*, Comments of Microsoft, ET Docket No. 02-135, at 7–9 (Jan. 27, 2003) ("[T]he full potential of unlicensed wireless networks will not be realized through opportunistic use and underlay alone."); Comments of Consumer Electronics Association, ET Docket No. 02-135, at 3–6 (Jan. 27, 2003) ("[A]dditional spectrum is needed beyond [underlays]."); Comments of Wi-Fi Alliance, ET Docket No. 02-135, at 2–3 (Jan. 27, 2003) (calling on Commission to designate additional bands for unlicensed spectrum).

[34] For example, manufacturers and other investors failed to invest in unlicensed personal communications service (UPCS) devices in the 1910–20 MHz band because of the presence of microwave incumbents that had not yet relocated and the strict spectrum etiquette and monitoring required by the rules to prevent interference. *Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, including Third Generation Wireless Systems*, Third Notice of Proposed Rulemaking, ET Docket No. 00-258, FCC 03-16, ¶¶ 43, 46 (rel. Feb. 10, 2003). This lack of investment ultimately resulted in the reallocation of the 10 MHz in question. *Id.* ¶ 46. The rules requiring spectrum monitoring were found to be burdensome even though there were no primary users in the band who were to be protected from interference. The example of UPCS in the 1910–20 MHz band, in contrast to the success of unlicensed devices in the 2.4 GHz and 5.7 GHz bands, illustrates the point that unlicensed operations are most likely to be successful in dedicated bands where interference is less of a concern and equipment manufacturers have sufficient incentives to invest in developing devices that operate on the spectrum in question.

II. THE COMMISSION'S PROPOSAL TO ADOPT THE INTERFERENCE TEMPERATURE APPROACH AND PERMIT NEW UNLICENSED OPERATIONS IN THE 12.75–13.25 GHZ BAND THREATENS IMPORTANT BAS OPERATIONS AND IS PREMATURE.

As discussed in Section I, implementation of an interference temperature metric poses significant technical challenges that have not yet been answered by the Commission. Accordingly, MSTV and NAB urge the Commission to further explore the interference temperature concept and address the many issues raised in the *NOI* before proceeding with a rulemaking proceeding with respect to any particular frequency band.[35]

In particular, MSTV and NAB oppose the Commission's proposal to apply the interference temperature approach and permit unlicensed devices to operate in the 12.75–13.25 GHz band. Although the propagation characteristics are not ideal, broadcasters currently use part of this spectrum to facilitate Broadcast Auxiliary Service ("BAS") mobile pickup operations such as electronic news gathering ("ENG").[36] Such operations are a vital piece of broadcast services providing the public with late-breaking news and live reports from locations outside the studio. Such news services are especially important in today's world of terrorist threats, where broadcasters perform valuable homeland security services through on-the-spot coverage of breaking news.[37] In addition, local television stations and broadcast networks use the 12.75–

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[35] *See Notice* at p. 31 (Separate Statement of Commissioner Jonathan S. Adelstein, Approving in Part, Concurring in Part) (opposing release of Notice or Proposed Rulemaking, as opposed to Notice of Inquiry, with respect to 12.75–13.25 GHz band).

[36] *See* 47 C.F.R. §§ 74.601, 74.602.

[37] Homeland Security Secretary Tom Ridge has stated that "obviously television and radio" are the "first choice" for disseminating information to the public during a terrorist attack. PBS Online News Hour, *Newsmaker: Tom Ridge*, Feb. 19, 2003, *available at* <http://www.pbs.org/newshour/bb/terrorism/jan-june03/ridge_2-19.html> ("JIM LEHRER: [S]ome people have mentioned that how is the ordinary American to find out about a terrorist attack …? Is there some kind of system being worked on for that? TOM RIDGE: Precisely. There are multiple ways that we can communicate the plan; but there are also (continued…)

13.25 GHz band to cover live local sporting events, such as NFL Football, Major League Baseball, and professional golf. The ability to provide live coverage of these events is extremely important because this type of content is helping to drive the digital transition.

The 12.75–13.25 band is used intensively, especially in urban areas. This band is used primarily for short-haul mobile pickup and studio-to-transmitter links. For example, a local station might use this frequency to send a short-haul signal from an office building to a station's ENG truck parked on the street below. In most cases, this is the only way to transmit a remote signal to the ENG truck. The technical characteristics and short-haul intermittent uses of the band make it extremely difficult to monitor interference. This is not a situation where there is continued use over long geographic areas that easily can be monitored. Instead, interference in this band generally would be site-specific, making monitoring more challenging and burdensome. More importantly, the need for these short-haul pickups becomes acute in emergency situations when stations all attempt to provide coverage at the same time. As a result, many of the proposed monitoring approaches and solutions to prevent interference from unlicensed devices that exceed the interference temperature cap are simply inappropriate for news gathering operations.

Finally, given the uncertainty associated with the relocation of BAS operations in the 2 GHz band, it is essential that broadcasters' ability to use the entire 12.75–13.25 GHz band for secure and interference-free BAS ENG not be compromised. The short-haul propagation characteristics of the 12.75–13.25 GHz band do not make it a viable choice for most ENG operations, particularly those covering larger geographic areas. To the extent that interference in

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multiple sets of circumstances under which some of them wouldn't work. And so obviously television and radio is our first choice. … [I]f the electricity is off, hopefully a battery-powered radio might help.").

the 12.75–13.25 GHz band increases because of new unlicensed operations, short-haul ENG operations may be forced to shift to other, already-crowded ENG bands. However, the FCC's spectrum policies have already increased pressure on these ENG bands, especially the 2 GHz band. It is contrary to the public interest for the FCC to create a situation that continually reduces the amount and integrity of spectrum devoted to live newsgathering. It simply is inappropriate for the Commission to launch an interference temperature experiment that further threatens this vitally important service. The newsgathering function of local television stations is too important to national security to be jeopardized by application of a new "spectrum management" theory.[38]

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The Commission should proceed cautiously as it evaluates the interference temperature metric and should ensure that it can be implemented in real-world environments before using such a metric to guide spectrum management decisions. Under no circumstances should the interference temperature metric be used to justify the introduction of unlicensed underlay operations in the broadcast spectrum, particularly during the already complex and daunting transition to DTV.

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[38] *See* Letter from Chairman Fred Upton, Chairman, House Comm. on Energy and Commerce, Subcomm. on Telecommunications and the Internet, & Ranking Member John D. Dingell, House Comm. on Energy and Commerce, to Michael Powell, Chairman, Federal Communications Commission 3 (Mar. 23, 2004) ("The coverage and delivery of local news events is integral to the concept of localism for broadcasters. And live, on-the-spot coverage of emergency situations has become a critical component of our national security policy. The American public should not lose real time information from the scene of a natural or man-made disaster because of an insufficient number of ENG channels or interference due to inconsistent ENG band plans.").

Respectfully submitted,

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